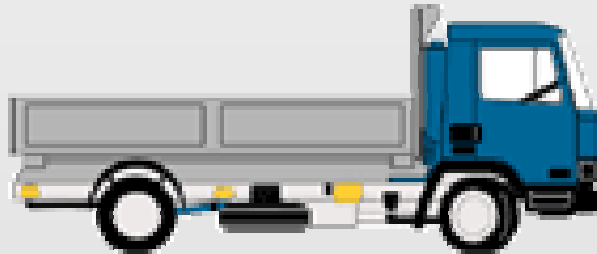


Proposal to Reduce Idling Emissions from On-Road Heavy-Duty Diesel Vehicles



**Public
Workshop
March 23, 2005
El Monte, CA**



California Environmental Protection Agency
Air Resources Board

Agenda

- Background
 - Why reduce idling emissions?
 - Existing measures
- Proposed Concepts
- Schedule
- Discussion

Why Reduce Idling?

- Heavy-duty diesel vehicle (HDDV) idling emissions are significant.
 - 2010 Statewide inventory from HDDVs (GVWR > 14K lbs):
NOx \cong 35 tpd¹ (~8% of total NOx exhaust from HDDVs)
- Reduced NOx emissions - a precursor to ozone
- Reduced exposure to diesel PM and other toxics
- Important to achieving air quality goals (SIP)
- Environmental justice
- Availability of alternative technologies
- Cost effective and comparable to other mobile source measures

¹California registered only and does not include school buses, transit buses or motorhomes.

Emissions Impact

Preliminary Estimates (tons/day)

Estimated Statewide Idling Emissions (tons/day)¹ California-Registered Heavy-Duty Diesel Vehicles

	CY 2005	CY 2010
Vehicles (GVWR > 14,000 lbs)	312,970	351,118
NOx	28.7	35.5
ROG	3.9	3.6
PM	0.9	0.7

¹Does not include reductions from existing idling measures.

Emissions Impact

Preliminary Estimates (tons/day)

- Out-of-State Registered HDDVs (GVWR > 33,000 lbs.)

Assumptions:

Average Idle Time: Sleeper: 6 hours/day; Non sleeper: 41 minutes/day

90% of total out-of-state registered vehicles have sleepers

All of the out-of state registered vehicles are 15 years old or newer.

	CY 2005	CY 2010
Model Years	1991-2005	1996-2010
Vehicles	45,044	50,268
NOx	31.2	34.9
ROG	2.64	2.58
PM	0.54	0.35

Existing Measures

- School Bus Idling (13 CCR 2480)
 - Limits idling to a maximum of 5 minutes
- Commercial Heavy-Duty Diesel Fueled Vehicle Idling (13 CCR 2485)
 - Limits idling to a maximum of 5 minutes
 - Applies to vehicles with GVWR > 10,000 lbs.
 - Exception: vehicles with sleeper berths

Proposed Requirements

- New Engine/Vehicle Requirements
- In-Use Vehicle Requirements
 - Modification of 13 CCR 2485 (rule adopted in July of 2004)

Proposed New Engine/Vehicle Requirements

- Applicability:
 - 2008+ MY engines, GVWR > 14,000 lbs
- Proposed Requirement
 - Automatic idle shutdown system
 - shuts down the engine after 5 minutes of idling
 - tamper-resistant and non-programmable
- Optional Requirement
 - Certify engine to a NOx idling emission standard not to exceed 30 g/hour during all idling operations - (low and high engine idle speeds under load)
 - Affix a label to the outside of the vehicle cab indicating that the engine meets the standard

Proposed New Engine/Vehicle Requirements

- APU Requirements (for use with 2008+ MY engines)
 - Engine manufacturers producing an integrated APU/engine system must control PM emissions by:
 - routing APU exhaust through the main engine PM filter, or
 - having a PM trap on the APU (Level 3 verified trap efficiency of 85% from Tier 4 level)
 - Aftermarket APU for use with 2007+ MY engines
 - comply with a verification procedure that would require the use of CA certified APUs.
 - Affix a label to the outside of the vehicle cab indicating that the engine is equipped with an integrated APU system or the APU has a Level 3 verified PM trap.

Proposed New Engine/Vehicle Requirements

- Vehicle Manufacturer Requirements
 - Vehicle Manufacturers responsible for the design and control of vehicle idle control would also need to comply with idle shutdown requirements.
 - Vehicle Manufacturers would also be required to affix the appropriate labels to the outside of the vehicles that meet the optional new engine requirements or those equipped with an integrated engine/APU system or level 3 verified APU system.

Proposed In-Use Vehicle Requirements

- Change applicability of 13 CCR 2485
 - Apply the 5-minute idling limit requirement to all heavy-duty diesel vehicles statewide including those with sleepers and out-of-state registered vehicles, and all model years starting in Calendar Year 2008.
- APU Requirements
 - MY 2006 and older vehicles can operate a California/federal certified APU system or an APU system that meets the low PM requirements.
 - Vehicles equipped with 2007+ MY engines may operate only an APU system that meets the low PM requirements.

Technology Feasibility

- Automatic idle shutdown system
 - existing in modern electronic engines
- Lower NOx idling emission Standard
 - aftertreatment NOx control (?)
 - cylinder deactivation
 - operational controls
- APU
 - Diesel APU may need active PM regeneration or integrating engine/APU exhaust system
 - Battery based
 - Fuel cell based

Other Options

- Fuel-fired heaters
- Truck stop electrification
 - Plug-in only
 - Full service
- Cold storage

Emission Reductions

- New Engine/Vehicle Requirements
- 2010 Statewide Emission Benefits (tons/day)

MY	Vehicles	NOx	ROG	PM
2008-2010	60,771	5.1	0.4	---

- Assumptions:
- Percent of heavy-heavy duty vehicles with sleeper berth = 20%
 - (based on 2002 VIUS database and input from several manufacturers)
- Medium-heavy and heavy-heavy duty vehicles without sleeper berths will be equipped with idle shutdown system
- Heavy-heavy duty vehicles with sleeper berth will use CA compliant APU system (additional PM control from Tier 4 level)
- Average Idle Time: Medium heavy = 17 min/day; Non sleeper = 41 min/day; Sleepers = 6 hours/day

Emission Reductions

- Pre-2008 California-Registered
- Sleeper Heavy-Duty Diesel Vehicles
- 2010 Statewide Emission Benefits (tons/day)

MY	Vehicles	NOx	ROG	PM
Pre-2008	24,767	11.1	1.5	0.1

- Assumptions:
- Percent of heavy-heavy duty vehicles with sleeper berth = 20%
 - (based on 2002 VIUS database and input from several manufacturers)
- Pre-2007 sleeper heavy-heavy duty vehicles will use a diesel APU certified to Tier 4 off-road standards
- Average idle time: Sleeper=6 hours/day

Emission Reductions

- Out-of-State Registered Heavy-Duty Diesel Vehicles (GVWR > 33,000 lbs)
- 2010 Statewide Emission Benefits (tons/day)

Vehicles	NOx	ROG	PM
50,268	24.2	2.0	--

- Assumptions:
- 90% of total out-of-state vehicles are sleepers
- All of out-of-state vehicles are 15 years old or newer
- Compliance = 100%
- Pre-2007 Sleeper vehicles will use an APU certified to Tier 4 off-road standards.
- 2007 to 2010 sleeper heavy-duty diesel vehicles will use CA compliant APUs.

Emission Reductions

- Total CY 2010 Statewide Emission Benefits from the Proposed Rule (tpd)

Vehicles	NOx	ROG	PM
135,806	40.4	3.9	0.1

Cost Effectiveness

- Vehicle Engine
 - Idle hours/year 2180
 - Fuel Consumption (gal/hour) 1
 - Average Fuel Cost (\$/gal) 2.18
- Diesel APU
 - Cost (\$) 10,000
 - Fuel Consumption (gal/hour) 0.2
 - Average Fuel Cost (\$/gal) 2.18
- Pay back period (years) 2.6

Schedule

- Staff report and draft regulatory language: May 2005
- Board hearing: July 21-22, 2005.

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<http://www.arb.ca.gov/listserv/truck-idling/truck-idling.htm>
- HDDV Idling Emission Reduction Program Websites:
<http://www.arb.ca.gov/msprog/truck-idling/truck-idling.htm>
<http://www.arb.ca.gov/toxics/idling/idling.htm>
<http://www.arb.ca.gov/toxics/sbidling/sbidling.htm>